

CLAIMS

1. A medical system comprising:  
a communication device (CD) including a CD telemetry subsystem selectively operable in a first state to transmit a preamble signal  
5 or a second state to transmit a message signal and wherein said preamble signal includes information predicting the time duration to the next message signal; and  
a medical device (MD) including an MD telemetry subsystem operable in either a signal receiving state or a low energy consuming state  
10 and wherein said MD telemetry subsystem in said signal receiving state is responsive to said information predicting time duration for switching to said low energy consuming state for a time interval related to said predicted time duration.
- 15 2. The system of claim 1 wherein said MD telemetry subsystem upon expiration of said time interval switches to said signal receiving state to receive said message signal.
- 20 3. The system of claim 1 wherein said medical device is configured for implantation in a patient's body; and wherein  
said communication device is configured for use external to said patient's body.
- 25 4. The system of claim 3 wherein said medical device includes a programmable MD processor and a therapeutic subsystem controllable by said MD processor for administering therapy to said patient's body; and wherein  
said MD telemetry subsystem upon expiration of said time interval switches to said signal receiving state for receiving said message  
30 signal; and wherein  
said received message signal operates to program said MD processor.

5. The system of claim 1 wherein said preamble signal comprises a serial bit stream defining a sequence of multiple words.

6. The system of claim 5 wherein said medical device further  
5 includes an MD processor for processing said preamble signal words to derive said predicted time duration therefrom; and wherein  
said MD processor is operable to switch said MD telemetry subsystem to said low energy consuming state for said time interval.

10 7. The system of claim 6 wherein said MD processor is operable to switch said MD telemetry subsystem to said signal receiving state upon expiration of said time interval.

8. The system of claim 6 wherein said medical device is  
15 configured for implantation in a patient's body; and wherein  
said communication device is configured for use external to said patient's body.

9. The system of claim 5 wherein each preamble word is  
20 comprised of an ordered sequence of N bits; and wherein  
a corresponding bit in each word defines a constant binary state.

10. The system of claim 5 wherein each preamble word is  
25 comprised of an ordered sequence of N bits; and wherein  
a corresponding bit in each word toggles between first and second binary states for each successive word.

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11. The system of claim 5 wherein each preamble word is comprised of an ordered sequence of N bits including a most significant bit and a least significant bit; and wherein

the most significant bit in each of said words defines a  
5 constant binary value and the least significant bit in each of said words toggles between first and second binary values for each successive word.

12. The system of claim 11 including means for performing an  
exclusive-OR operation with respect to successive words to produce a most  
10 significant bit result having a first binary value and a least significant bit result having a second binary value.

13. The system of claim 11 further including means for recognizing  
the transition between said most significant bit result and said least  
15 significant bit result.

14. The system of claim 1 wherein said preamble signal comprises  
a monotonic sequence of count values where each value defines the time  
duration to the next message signal.

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15. The system of claim 14 wherein said monotonic sequence is  
comprised of decrementing count values.

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16. A method of operating a battery powered implantable medical device, responsive to RF message signals from an external communication device, so as to minimize power consumption in said medical device, said method comprising:

5                    configuring said medical device so that it normally operates in a low energy consuming state and periodically switches to a signal receiving state for a limited duration listening window;

                  operating said communication device to transmit an RF preamble signal prior to transmission of each RF message signal;

10                  encoding in said preamble signal information predicting the time duration to the next message signal;

                  causing said medical device during a signal receiving state to decode said predicting information to determine the time duration to the next message signal; and

15                  switching said medical device to said low energy consuming state for a time interval related to said determined time duration.

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17. A medical system comprising:

At least one medical device (MD) including an MD power source, an MD therapeutic subsystem, and MD telemetry subsystem, and a programmable MD processor for controlling the operation of said MD therapeutic subsystem and/or said MD telemetry subsystem; and

a communication device (CD) including a CD telemetry subsystem selectively operable to transmit a preamble signal to said MD telemetry subsystem or to transmit a message signal to said MD telemetry subsystem, and wherein control information is embedded in said preamble signal for processing by said MD processor to minimize power consumption in said medical device.

18. The system of claim 17 wherein said embedded control information includes an identification identifying at least one of said medical devices.

19. The system of claim 17 wherein said embedded control information includes time information predicting the time duration to the next message signal.

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20. The system of claim 19 wherein said MD telemetry subsystem is operable in either a sleep low energy consumptive state or an awake high energy consumptive state; and wherein

said medical device is responsive to said time information for causing said MD telemetry subsystem to be in said sleep state for the predicted time duration to the next message signal.

21. The system of claim 17 wherein said preamble signal comprises a bit stream comprised of successive N bit words; and wherein

a first fixedly positioned bit in each of said N bit words defines a constant binary value and a second fixedly positioned bit in each of said N  
5 bit words comprises a toggle bit whose binary value switches for each successive word.

22. The system of claim 21 including means for performing an exclusive OR operation with respect to each pair of successive words to  
10 produce an XOR result; and

means for processing said XOR result to determine word boundaries in said bit stream.

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